Emotional Diary

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Capstone Design Project

Abstract

This document presents an emotional diary app. In traditional diary apps, users choose their emotions and pen their diary entries. However, the variety of emotions available in most apps is significantly limited. Users may sometimes struggle to identify their exact feelings. Regular diary writing enables individuals to track their emotions over time, which necessitates the motivation for consistent entries. Keeping these features in mind, our service uses an AI model to automatically generate emotion beads based on the text written by the user. Additionally, we have designed the service to stimulate the desire to collect emotion beads through an attractive UI and a social app sharing feature.

Keywords: emotional bead · attractive UI · extract feelings by AI model · social app sharing

1 Introduction

In modern society, stress has become an inevitable part of our daily lives. Particularly, the MZ generation has been showing increasing interest in mental health due to various life burdens and stress. Accordingly, it has become important to understand and manage one's emotional state. In response to this situation, we introduce an AI-based diary application as a new way to record and manage emotions.

This app helps users record and analyze their emotional state of the day by writing a diary. When users simply write a diary in text, the AI model extracts emotions from the text to understand and record the user's emotional state. Through this, users can more accurately understand the emotions they felt that day and monitor changes in their emotions over time.

In addition, this app can help users set and manage goals. By writing goals in the diary and recalling the emotions felt, it can effectively provide motivation. This feature helps users manage their daily lives more effectively and handle stress better.

Moreover, this app helps users more actively manage their mental health. By accurately recording and understanding the emotions felt while writing a

diary, users can better understand their emotional state and maintain a healthier mental life based on this.
Thus, our app helps users manage their daily lives and emotions more effectively. By recording and analyzing the user's daily life, our goal is to help users better understand their lives and live happier. Through this app, our goal is to help users manage their lives more effectively and live happier.
We have developed a basic app using Flutter and stored diary information written by users through Firebase. We used the GPT model to extract emotions based on the text input by the user, and created emotion beads based on the extracted emotions.
In the app, users can first log in with their Google ID. Users can extract and collect emotion beads for each day they write a diary, and if there are no emotions, it is displayed as a gray empty bead. Users can check collected beads at a glance with a monthly calendar. They can also share their collected bead calendar through the social app sharing feature.
Users can check each emotion with the recorded diary, and can also choose the color of the bead that matches the emotion themselves.

2 Design

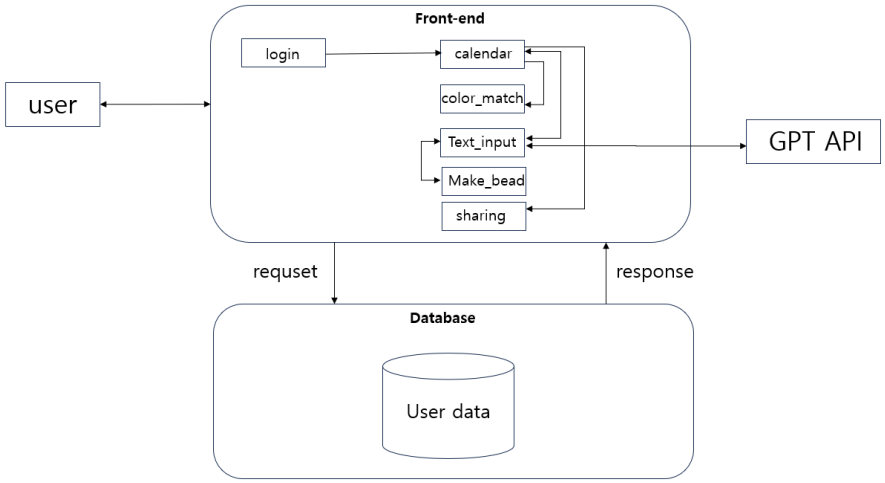

Figure 1: Overall Architecture

2.1 Overall Architecture

The system of the Emotional Diary app consists of the frontend, a database that stores user data, and a GPT API that extracts emotions from the user's text.

In the frontend, the records left by the user logging in with their Google ID are stored in Firebase as data. Once the user completes the text work, the related emotions are extracted through the GPT API.
The data includes the user's diary text, extracted emotions, and the color of the bead chosen by the user according to the emotion(Figure 1).

2.2 Core Skill/Technique/Model

For the front-end part, we chose Flutter, which can be easily learned and quickly developed. We learned it in the early stages of the project period and proceeded with the development. Also, Flutter is compatible with Firebase, making user data management easy. Therefore, we added the Google login feature provided by Firebase to manage user data.

And We use a state-of-the-art Large Language Model (LLM) based service ChatGPT to extract emotional expressions. We have selected the model that recorded best performance: ChatGPT-4.
We use OpenAI's Chat Completion API to extract the inherent feeling in diary. By posting context(prompt), model name, it responses with completed chat.

2.3 Challenges

Having mainly studied artificial intelligence and Python, it wasn't easy to work with unfamiliar things like Flutter and Dart. We spent a lot of time on prompt engineering to extract the appropriate emotion using the ChatGPT API. There was a tendency to recognize words in the given diary as emotions and extract them directly, not the emotion list provided. To solve this, I tried various methods such as various prompt engineering techniques and providing few-shots similar to GPT training data, and improved it.

And in sharing feature part, first, we expected that sharing functions would not take long time to make it. However, because Meta doesn't provide official package for flutter, we should use unofficial package.
In that process we tried three packages to make this function so it took more time than we expected.
All the packages don't provide auto capturing and saving function. So, we developed additional function for auto capturing and saving. By producing a temporary screenshot and delivering the image's path to the package, we can solve this problem. Therefore, user's usage becomes more convenient.

3 Implementation

3.1 UX/UI Viewpoints

followings are about each feature of the Emotional Diary app.

First, the login screen. This has been implemented through the Google login service provided by Firebase. Users can easily log in with just a Google ID(Figure 2).

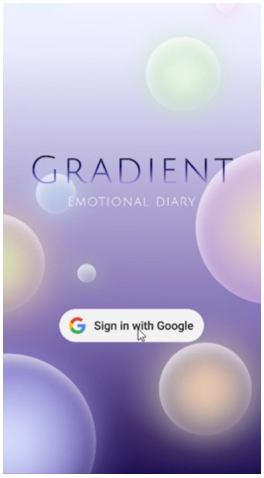

Figure 2: Login Page

After logging in, the user is directed to a monthly calendar page made up of collected emotion beads. In the case of a fact-based diary without emotion, it is represented by a gray bead indicating 'No Emotion'. Here, users can modify or delete emotions or text for each date. Also, a new diary entry can be created through the '+' button(Figure 3).

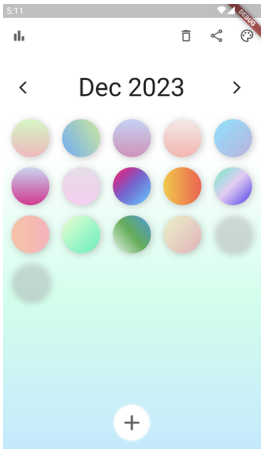

Figure 3: Calendar

Users can assign bead colors for each emotion on the emotion palette page. By clicking on the palette icon in the upper right, you can customize the color in detail. Also, by clicking on the bead icons arranged on the left for each emotion, you can change the color(Figure 4).

Figure 4: Pallete

On the text input page, users can first specify the date at the top. After writing the text and clicking the 'Create Bead' button, the color of the bead changes to the color that matches the emotion extracted through the AI model(Figure 5).

Figure 5: User input Text

Figure 6: Text Emotion

Not only does it express the emotion in color with beads, but it also represents what kind of emotion it is in text, as shown in Figure 6.

If the emotion extracted through AI is determined not to be the emotion the user is feeling, the user can directly select and modify the bead on this page Figure 7.

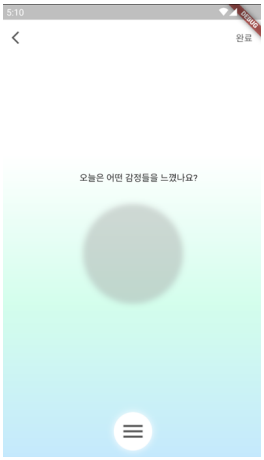

Figure 7: Change Bead

Users can capture and share the collected bead calendar screen on social apps (Instagram) by clicking the share icon on the calendar screen(Figure 8).

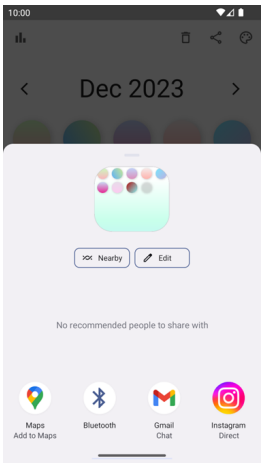

Figure 8: Sharing

3.2 Detail

We pre-store basic emotion-related data in Firebase, carefully selecting from the union of Plutchik's wheel of emotions and universally used emotional expressions to avoid as much overlap as possible.(Figure 9).

When a user completes writing a diary in the text input field, a HTTP post request is made with the written text data. Then, we use a function to extract emotions based on the written text through the GPT API and respond. Next, we decode the response from GPT into JSON format. We extract the emotion part from the JSON file and represent it with beads through matching colors(Figure 10).

4 Evaluation

We have implemented all the features we initially planned, excluding the counseling connection feature. Among them, we tested the main feature that allows users to share the collected bead calendar on Instagram through the share button, and the feature that extracts emotions through GPT based on the text written by the user, and both worked well.

After writing the text, users can more easily check the part about emotions, and they can share the collected emotion beads with others or check their past emotions whenever they are curious.
Through this, users are expected to be able to manage their daily lives more efficiently and get help in managing their mental health.

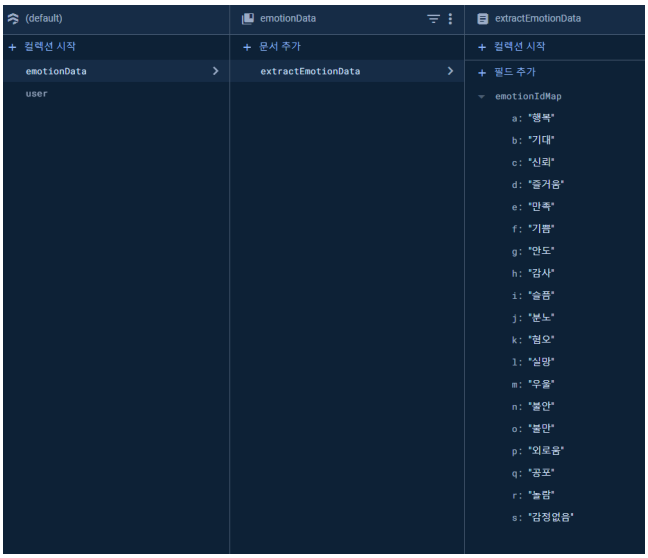

Figure 9: Emotion Data

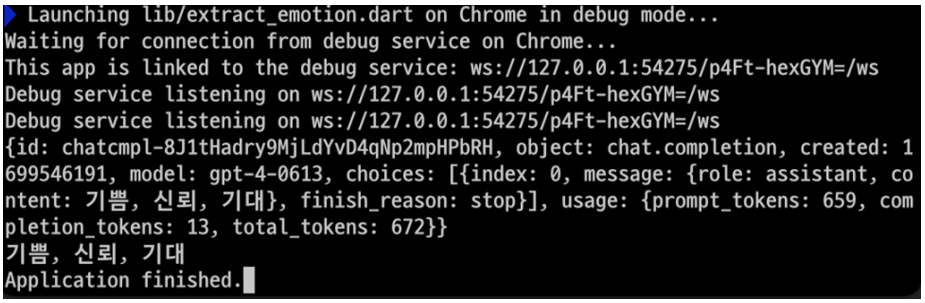

Figure 10: JSON

4.1 Evaluation Metrics

We used Accuracy as a metric to compare the results of prompt engineering(Table 1).
For each diary, ChatGPT extracts three emotions, and the accuracy is calculated by the number of correctly extracted emotions / the total number of emotions that should be extracted (3). (ex. If only 'depression' was correctly extracted from (joy, sadness, depression), the accuracy is 1/3, 33%)

We wrote 5 diaries for each Case A, B, C and measured the total accuracy.
Case A: Separating one's own emotions from those of others.
Case B: Answering with emotions that exist in the emotion list, not the emotions written in the diary.

Case C: Diary listing facts without emotion (If the answer for Case C was 'no emotion', it was considered correct, otherwise it was considered incorrect).

	Baseline	Few-shot	Few-shot + multiple choice
Case A	8/15 (0.53)	11/15 (0.73)	12/15 (0.8)
Case B	6/15 (0.4)	8/15 (0.53)	13/15 (0.87)
Case C	3/5 (0.6)	1/5 (0.2)	3/5 (0.6)
Total	17/35 (0.48)	20/25 (0.57)	28/35 (0.8)

Table 1: Evaluation Metrics

5 Limitations and Discussions

Users can choose colors directly based on their emotions, and although various emotions exist in the data, there is a possibility that the emotion a user wants may not be present due to the vast variety of emotions. This is something we plan to gradually improve through user testing.

6 Related Work

6.1 Related Services

There are already various emotion diary apps like 'Daylio' and 'Moodpress'. However, all of them allow you to express your emotion with only one emotion per day. Also, because the number of emotions is very limited, we found many reviews wishing they could set the emotions themselves or that the icons expressing the emotions were more diverse(Figure 11).

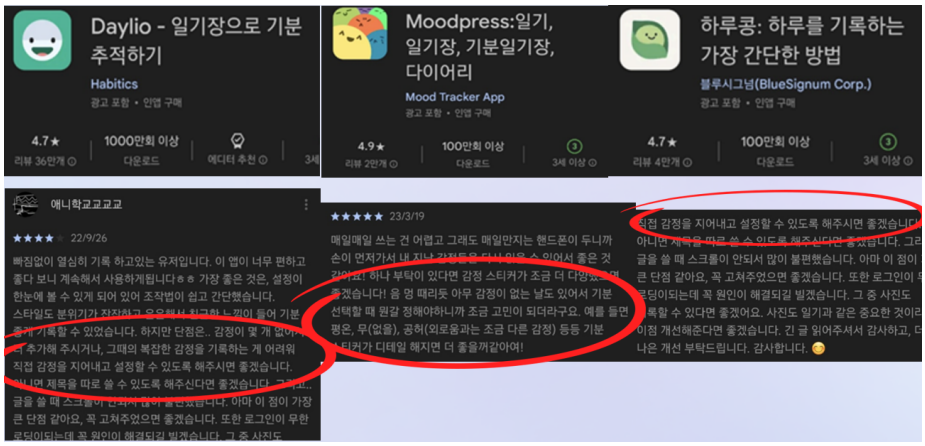

Figure 11: Existing App

7 Conclusion

Existing emotion diary apps have the limitations of expressing only a single emotion per day and having a limited number of emotions. To address these issues, our application is designed to allow users to express a complex mix of emotions they experience throughout the day. Furthermore, by utilizing Plutchik's Wheel of Emotions, we included a wide range of universal emotions, providing users with the flexibility to set their own emotions, distinguishing our app from others.
In addition, our app enriches user interaction by analyzing the user's text using an AI model and expressing the corresponding emotion as a bead. This not only helps users better understand and express their emotions but also enhances the interest in using the app.

Therefore, our application is expected to stand out in the emotion diary app market by overcoming the limitations of existing emotion diary apps and providing a new way of service that meets the needs and interests of users. These points are the core values of our application, and by providing a more rich and accurate emotional expression experience, it will be of great help in recording and understanding users' daily emotions.

8 References

1. Firebase auth - google signin,
https://firebase.google.com/docs/auth/android/google-signin?hl=ko